AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (previously presented): A measuring device for measuring an in-plane magnetization vector component of a magnetic substance to be measured, comprising:

a light source;

a focusing unit for focusing light flux from said light source and irradiating it to the magnetic substance to be measured;

a polarization split detector for detecting a light amount of a polarization component in one direction or for separating each component of polarization components orthogonal to each other using a polarizer and photo-detectors in order to detect a change in polarization state or light amount of the light flux reflected by the magnetic substance to be measured due to a magneto-optical effect; and

a half-turn asymmetric polarizing element acting only on the reflected light from the magnetic substance to be measured and acting in such a manner that its action on polarization distribution in a cross section of incident light flux has an asymmetric nature of about a half-turn around an optical axis.

Claim 2 (previously presented): The measuring device according to claim 1,

wherein said half-turn asymmetric polarizing element is a half-turn asymmetric reflectional symmetry polarizing element whose action on the incident light flux has reflectional symmetry nature with respect to a certain plane including the optical axis so that only one component of the in-plane magnetization vectors of the magnetic substance to be measured can be measured separately from the other orthogonal components.

Claim 3 (original): The measuring device according to claim 1,

wherein said half-turn asymmetric polarizing element is a divisional half-wave element constituted of a half-wave element acting on a part of the cross section of the light flux to generate half-wave phase difference, or half-wave elements having different neutral axis azimuths in divided regions in the cross section of the light flux.

Claim 4 (previously presented): The measuring device according to claim 1,

wherein said half-turn asymmetric polarizing element is a divisional polarization rotation element having non-uniform polarization rotation action in the cross section of the light flux.

Claim 5 (previously presented): The measuring device according to claim 1,

wherein said half-turn asymmetric polarizing element is a divisional phase modulator capable

of controlling a phase difference generated in each divisional region.

Claim 6 (original): The measuring device according to claim 1,

wherein the photo-detector has an image detection element and an imaging lens for forming an image on the image detection element so that image data of in-plane magnetized distribution of the magnetic substance to be measured can be obtained.

Claim 7 (original): The measuring device according to claim 1,

wherein said focusing unit includes a near-field probe for generating near-field light and a focusing part for focusing propagation light generated as a result of interaction of the near-field light and the magnetic substance to be measured.

Claim 8 (previously presented): The measuring device according to claim 1, further comprising:

a probe having the magnetic substance,

wherein the magnetization vector component of the magnetic substance of said probe is measured so that spatial magnetic field vector components at a probe position can be measured.

Claim 9 (original): The measuring device according to claim 1, further comprising:

a light scanning unit for scanning a focusing spot position where a light beam from said light

source is focused by said focusing unit; and

an automatic position control stage for moving and controlling a position of said half-turn asymmetric polarizing element in synchronization with scanning in at least one direction by said light scanning unit.

Claim 10 (original): The measuring device according to claim 1, further comprising:

a relay lens for optically aligning a position of the light flux incident on said half-turn asymmetric polarizing element with a position of a pupil of said focusing unit.

Claim 11 (original): The measuring device according to claim 1,

wherein said half-turn asymmetric polarizing element receives passed light or passed and reciprocated light through the magnetic substance to be measured, and measures polarization rotation of the magnetic substance to be measured due to a Faraday effect.

Claim 12 (original): The measuring device according to claim 1,

wherein said focusing unit includes a solid immersion lens.

Claim 13 (previously presented): The measuring device according to claim 1, further comprising:

a probe having the magnetic substance in a focusing part of said focusing unit,

wherein the magnetization vector component of the magnetic substance of said probe is measured so that spatial magnetic field vector components at a position where said probe is placed can be measured.

Claim 14 (previously presented): The measuring device according to claim 1,

wherein said focusing unit is constituted of a focusing lens or a focusing mirror, a light scattering type near-field probe arranged at a focusing position thereof and having a sharp tip, wherein the light scattered at the probe tip and the magnetic substance to be measured is focused to detect change in polarization state or reflectivity thereof.

Claim 15 (original): The measuring device according to claim 2,

wherein said half-turn asymmetric reflectional symmetry polarizing element is divided by a straight line in two regions in the cross section of light flux, and each of the two regions is constituted of a half-wave element whose angles of a neutral axis from the straight line are +22.5 degree and -22.5 degree.

Claim 16 (previously presented): The measuring device according to claim 1, further comprising:

a Faraday cell provided before the magnetic substance to be measured or in an optical path where the light reflected by the magnetic substance to be measured reciprocates,

wherein a position and modulation spatial distribution of said half-turn asymmetric polarizing element are controlled to minimize a modulation amount of an output signal of said polarization split detector caused by modulation of said Faraday cell so that a position where detection of a perpendicular magnetization vector component is minimized can be found.

Claim 17 (previously presented): The measuring device according to claim 1, further comprising:

a Faraday cell which is provided before the magnetic substance to be measured or in an optical path where the light reflected by the magnetic substance to be measured reciprocates and whose polarization rotation angle is previously corrected; and

a conversion unit for registering a relationship between an output of said polarization split detector and a polarization rotation angle by said Faraday cell in a state of measuring a perpendicular magnetization vector component, and converting the output of said polarization split detector to the polarization rotation angle using the registered relationship in measuring the in-plane magnetization vector component.

Claim 18 (previously presented): A measuring device comprising:

a half-turn asymmetric reflectional symmetry polarized light source, as a light source, for outputting light flux whose intensity distribution has a symmetric nature while polarization state distribution does not have a symmetric nature of about a half-turn around an optical axis in a cross

section of the light flux perpendicular to the optical axis, as well as whose intensity distribution and polarization state distribution in the cross section of the light flux are both symmetric about a reflection with respect to a certain plane including the optical axis as a boundary plane;

a focusing unit for focusing the light flux from said half-turn asymmetric reflectional symmetry polarized light source and irradiating it to a magnetic substance to be measured; and

a polarization split detector for detecting a light amount of a polarization component in one direction or for separating each component of polarization components orthogonal to each other using a polarizer and photo-detectors in order to detect a change in polarization state or light amount of the light flux reflected by the magnetic substance to be measured due to a magneto-optical effect,

wherein an optical element, existing in an optical path from the light output of said light source to a position immediately before said polarization split detector and acting on the light flux, acts on light intensity distribution and polarization distribution in the light flux which is symmetric around half-turn around an optical axis and reflection with respect to the boundary plane, and one or two polarization split detection azimuths orthogonal to each other of said polarization split detector and the boundary plane or a reflectional symmetry plane of the light flux incident, when there is no magneto-optical action by the magnetic substance to be measured, is set to make angles of integral multiples of 90 degrees, so that only one component of in-plane magnetization vectors of the magnetic substance to be measured can be measured separately from the other orthogonal components.

Claim 19 (currently amended): The measuring device according to claim 18,

wherein said half-turn asymmetric reflectional symmetry polarized light source includes:

a natural light source, a partially polarized light source, or a linearly polarized light source; and

a divisional polarizer constituted of a polarizer which takes one of the polarization components and acts non-uniformly in a cross section of light flux outputted from the ~~linearly polarized~~ light source.

Claim 20 (previously presented): The measuring device according to claim 18,

wherein said half-turn asymmetric reflectional symmetry polarized light source includes:

a linearly polarized light source; and

a divisional half-wave element having an element which generates a half-wave phase difference and acts non-uniformly in a cross section of light flux outputted from the linearly polarized light source.

Claim 21 (previously presented): The measuring device according to claim 18,

wherein said half-turn asymmetric reflectional symmetry polarized light source includes:

a linearly polarized light source; and

a divisional polarization rotation element having an element which rotates the polarization

and acts non-uniformly in a cross section of light flux outputted from the linear polarized light source.

Claim 22 (previously presented): A measuring device for separately measuring only one component of in-plane magnetization vectors of a magnetic substance to be measured from the other orthogonal components, comprising:

a light source;

a focusing unit for focusing light flux from said light source and irradiating it to the magnetic substance to be measured;

a polarization split detector for detecting a light amount of a polarization component in one direction or for separating each component of polarization components orthogonal to each other using a polarizer and photo-detectors to detect change in polarization state or light amount of the light flux reflected by the magnetic substance to be measured due to a magneto-optical effect; and

a divisional half-wave element placed in an optical path between said light source and said focusing unit where the light reciprocates, and constituted of half-wave elements which are divided into two regions with a straight line as a boundary in a cross section of the light flux and whose respective neutral axes in the two regions and the boundary make angles of the same absolute value with opposite signs.

Claim 23 (previously presented): A measuring device for measuring an in-plane magnetization vector component of a magnetic substance to be measured, comprising:

a light source;

a focusing unit for focusing light flux from said light source and irradiating it to the magnetic substance to be measured;

a polarization split detector for detecting a light amount of a polarization component in one direction or for separating each component of polarization components orthogonal to each other using a photo-detector to detect a change in polarization state or light amount of the light flux reflected by the magnetic substance to be measured due to a magneto-optical effect; and

a divisional half-wave element in an optical path before said focusing unit where the light reciprocates, whose action on the polarization distribution in a cross section of the light flux has an asymmetric nature of about a half-turn around an optical axis.

Claim 24 (new): The measuring device according to claim 1, further comprising:

a Faraday cell provided in an optical path before the polarization split detector,

wherein a position or modulation spatial distribution of said half-turn asymmetric polarizing element are controlled to minimize a modulation amount of an output signal of said polarization split detector caused by modulation of said Faraday cell so that the position or modulation spatial distribution where detection of a perpendicular magnetization vector component is minimized can be found.

Claim 25 (new): The measuring device according to claim 1, further comprising:

a Faraday cell provided in an optical path before the polarization split detector and whose polarization rotation angle is previously corrected; and

a conversion unit for registering a relationship between an output of said polarization split detector and a polarization rotation angle by said Faraday cell in a state of measuring a perpendicular magnetization vector component, and converting the output of said polarization split detector to the polarization rotation angle using the registered relationship in measuring the in-plane magnetization vector component.

Claim 26 (new): The measuring device according to claim 18, wherein the photo-detector has an image detection element and an imaging lens for forming an image on the image detection element so that image data of in-plane magnetized distribution of the magnetic substance to be measured can be obtained.

Claim 27 (new): The measuring device according to claim 22, wherein the photo-detector has an image detection element and an imaging lens for forming an image on the image detection element so that image data of in-plane magnetized distribution of the magnetic substance to be measured can be obtained.

Claim 28 (new): The measuring device according to claim 23, wherein the photo-detector has an image detection element and an imaging lens for forming an image on the image detection element so that image data of in-plane magnetized distribution of the magnetic substance to be measured can be obtained.

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